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Three new species of *Septobasidium* (*Septobasidiaceae*) from Gaoligong Mountains in China

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Abstract — Three new species, *Septobasidium gaoligongense* and *S. euryae-groffii* on *Eurya groffii* associated with *Pinnaspis* spp. and *Septobasidium polygoni* on *Polygonum campanulatum* associated with *Pseudaulacaspis kuisiuensis*, are described. They were collected from Gaoligong Mountains in Yunnan Province, China.

Key words — *Pucciniomycetes*, *Septobasidiales*, taxonomy

Previously, a new species of *Septobasidium* was found in Gaoligong Mountains of Yunnan province (Lu & Guo 2009b). From the same area an additional three new species are described as follows:

Septobasidium gaoligongense C.X. Lu & L. Guo, **sp. nov.** Figs. 1–6

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Basidiomata resupinata, 15–20 cm longa, 7.5–8 cm lata, cinnamomeo-brunnea, brunnea vel atrobrunnea, margine determinata, superficie laevia, maturitate fissurata, in sectione primum (260–)525–580 µm crassa, deinde 1360–5000 µm crassa. Subiculum brunneum, 30–50 µm crassum. Contextus 2–3-stratosus. Columnae hyalinae vel brunneolae, primum 190–430 µm longae, deinde 3000–4900 µm longae, 290–340 µm latae, ex hyphis 3–5 µm latis compositae. Hymenium hyalinum, 40–50 µm crassum. Basidia fusiformia, cyclindrica vel leviter irregularia, recta vel leviter curvata, 4-cellularia, 17–26 × 4–7 µm, hyalina vel brunnea. Sine probasidio. Basidiosporae non visae. Haustoria ex hyphis irregulariter spiralibus constantia.

Type: On *Eurya groffii* Merr. (*Theaceae*): China, Yunnan, Gaoligong Mountains, Baoshan, Baihualin, alt. 1400 m, 8.VII.2009, T.G. Hou 17, HMAS 199577 (**holotype**), associated with *Pinnaspis* sp. (*Diaspididae*).

*corresponding author

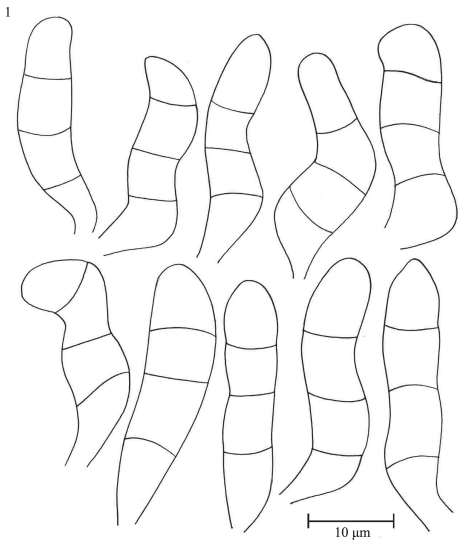
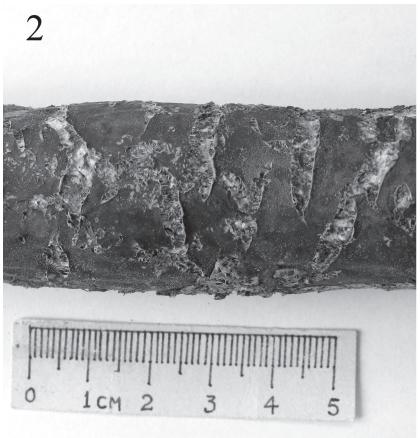


Fig. 1. Basidia of *Septobasidium gaoligongense* (HMAS 199577, holotype).

Basidiomata on branches, resupinate, 15–20 cm long, 7.5–8 cm wide, cinnamon-brown, brown or dark brown; margin determinate; surface smooth at first, becoming cracked at maturity. In section (260–)525–580 μm thick in the young stage and 1360–5000 μm thick in the old stage. Subiculum 30–50 μm thick, brown. Pillars 190–430 μm high in the young stage, 3000–4900 μm high in the old stage, 290–340 μm wide, hyphae of pillars 3–5 μm thick, hyaline or brownish, forming 2–3 horizontal layers. Hymenium 40–50 μm thick, hyaline. Basidia arising directly from the hyphae, fusiform, cylindrical or slightly irregular, straight or slightly curved, 4-celled, 17–26 × 4–7 μm, hyaline or brown, without a probasidial cell. Basidiospores not seen. Haustoria consisting of irregularly coiled hyphae.

Remarks: Morphologically, *S. gaoligongense* is similar to *S. crinitum* (Fr.) Couch, but differs mainly in forming 2–3 horizontal hyphal layers, having smaller basidia (17–26 × 4–7 μm vs 40–55 × 8.4–10 μm), and lacking a top layer. *Septobasidium crinitum* has a thick top layer (100–200 μm high), and lacks horizontal layers.

Figs. 2–6. *Septobasidium gaoligongense* (HMAS 199577, holotype). 2. Basidiomata on branches. 3. Basidia (arrows). 4. Haustoria. 5. Pillars. 6. Section of basidioma.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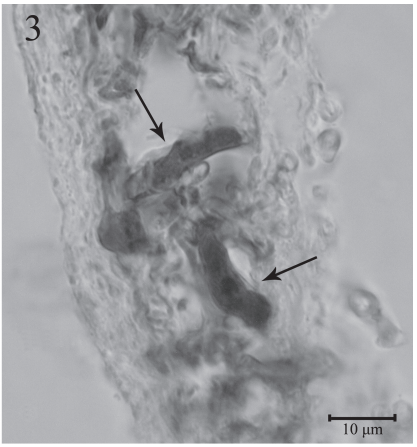
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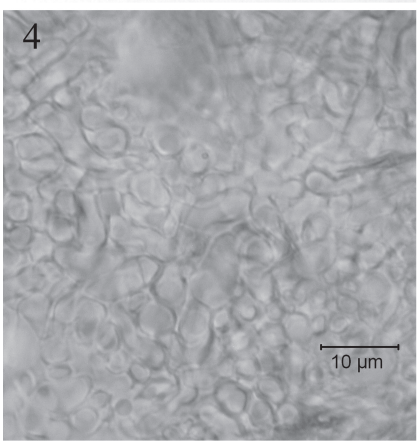
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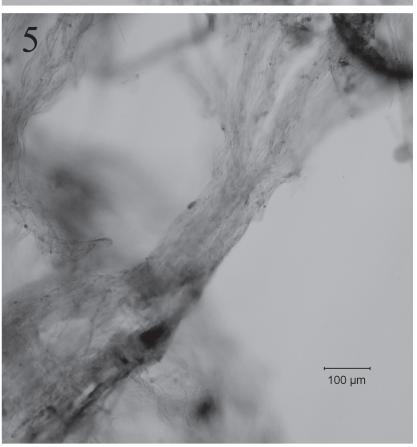
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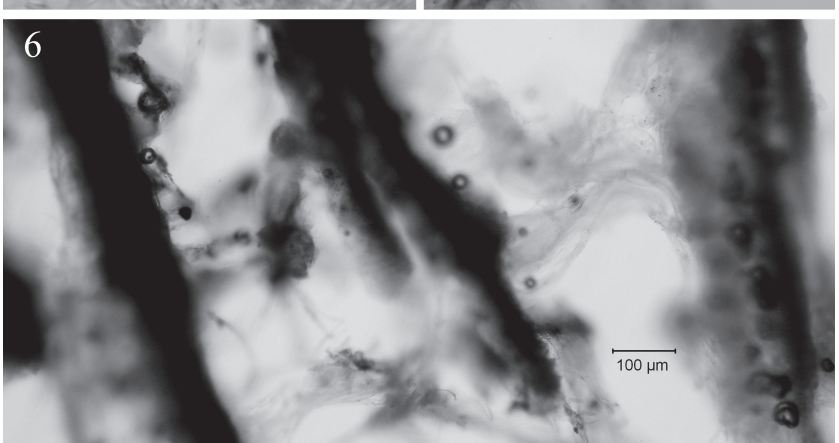
6
100 µm

Septobasidium polygoni C.X. Lu & L. Guo, **sp. nov.** Figs. 7–13

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Basidiomata resupinata, 2–15.5 cm longa, 1–3 cm lata, alba, cinnamomeo-brunnea vel brunnea, margine determinata, superficie laevia, in vetustate separata, in sectione 390–1550 µm crassa. Subiculum hyalinum vel brunneum, 30–100 µm crassum. Columnae hyalinae vel brunneae, primum 50–80 µm altae, deinde 440 µm altae, 30–70 µm crassae vel hyphis laxe completae, interdum hyphae repullulantes, super hymenium stratum

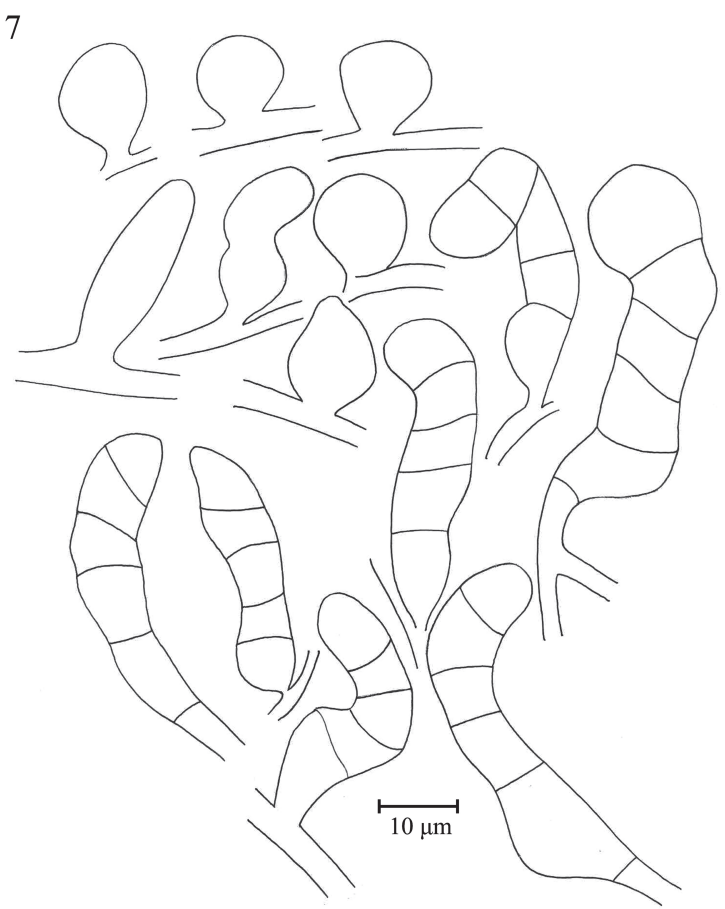
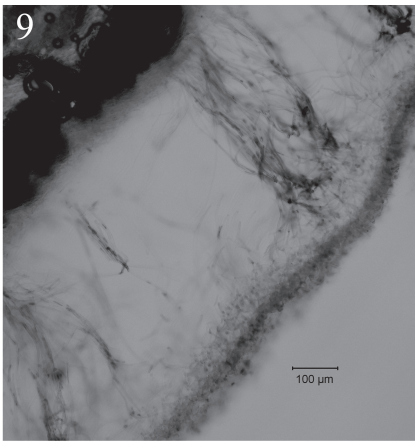
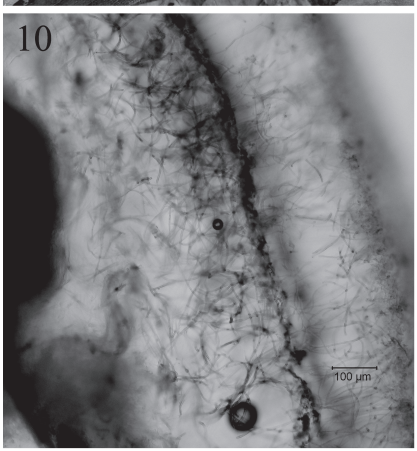


Fig. 7. Probasidia and basidia of *Septobasidium polygoni* (HMAS 196488, holotype).

Figs. 8–13. *Septobasidium polygoni* (HMAS 196488, holotype). 8. Basidiomata on branches. 9–10. Sections of basidiomata. 11. Probasidia. 12. Basidium (arrow). 13. Haustoria.

8


9
100 µm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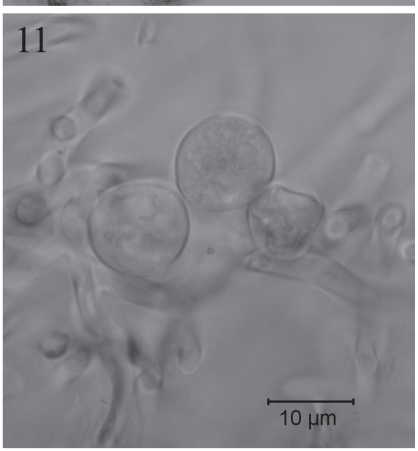
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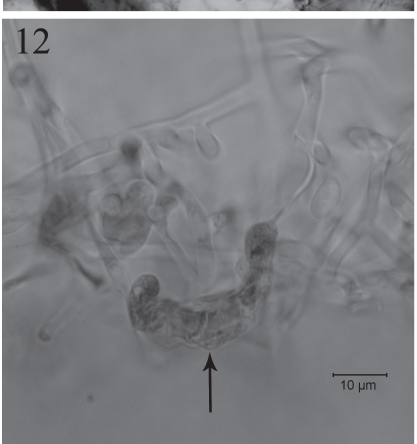
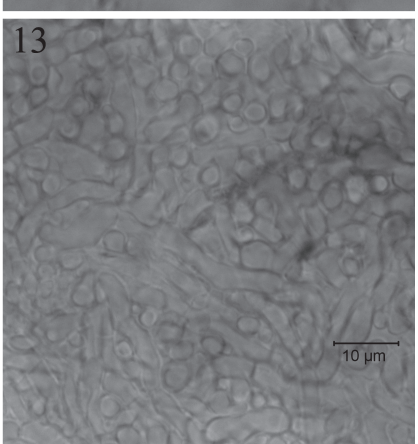
10 µm


12
10 µm


13
10 µm

hypharum secundum 50–200 µm altum formantes. Hymenium 50–100 µm crassum, unistratosum vel 2-stratosum. Probasidia subglobosa vel pyriformia, 10–17 × 10–15 µm, subhyalina vel flavidobrunnea, persistentia. Basidia cyclindrica, curvata, 4-cellularia, 24.5–34 × 7.5–10 µm, hyalina or flavidobrunnea. Basidiosporae non visae. Haustoria ex hyphis irregulariter spiralibus constantia.

Type: On *Polygonum campanulatum* Hook. f. (*Polygonaceae*): China, Yunnan, Gaoligong Mountains, Tengchong, alt. 2050 m, 5.IX.2008, S.H. He, Y.F. Zhu & L. Guo 2371, HMAS 196488 (**holotype**), associated with *Pseudaulacaspis kuisiuensis* (*Diaspididae*).

Basidiomata on stems and branches, resupinate, 2–15.5 cm long, 1–3 cm wide, white, cinnamon-brown or brown; margin determinate; surface smooth, peeling off in old stage. In section 390–1550 µm thick. Subiculum hyaline or brown, 30–100 µm thick. Pillars hyaline or brown, 50–80 µm high in young stage, up to 440 µm high in old stage, 30–70 µm wide, or loosely filled with 220–400 µm high hyphae, sometimes from hymenial layer the fungal hyphae renews growth to form a second hyphal layer, 50–200 µm high. Hymenial layer 50–100 µm thick, single or 2-stratose. Probasidia subglobose or pyriform, 10–17 × 10–15 µm, subhyaline or pale yellowish brown; probasidial cell persistent after the formation of the basidia. Basidia cylindrical, curved, 4-celled, 24.5–34 × 7.5–10 µm, hyaline or yellowish brown. Basidiospores not seen. Haustoria consisting of irregularly coiled hyphae.

Remarks: Morphologically, *S. polygoni* is similar to *S. citricola* Sawada from which it differs in having tall pillars (up to 440 µm vs 84–126 µm), a thinner hymenium (50–100 µm vs 100–390 µm), and smaller basidia (24.5–34 × 7.5–10 µm vs 50–65 × 8.2–9.7 µm).

Septobasidium euryae-groffii C.X. Lu & L. Guo, **sp. nov.** Figs. 14–19

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Basidiomata resupinata, 5–16 cm longa, 4–11 cm lata, cinnamomeo-brunnea, brunnea vel castaneo-brunnea, margine determinata, superficie laevia et protuberantia, deinde fissurata, in sectione 1260–2620 µm crassa, 3–12-stratosa. Subiculum 40–50 µm crassum, brunneum. Columnae 40–100 altae, 50–165 µm latae, superne ramosae tunc strato hypharum 360–560 µm alto formantae, hyphae repullulantes tum duo strata horizontalia 130–180 µm alta formantes. Hymenium 50–60 µm crassum. Interdum super hymenium columnae secundae 60–110 µm altae formatae et strata hypharum 4-stratosa 810–1050 µm alta successive superposita. Hymenium denuo formatum 70–110 µm altum. Basidia cylindrica, recta vel leviter curvata, 4-cellularia, 20–45 × 5–8 µm, hyalina or brunneola. Sterigmata conica, 2–3 µm longa. Sine probasidio. Basidiosporae non visae. Haustoria ex hyphis irregulariter spiralibus constantia.

Type: On *Eurya groffii* Merr. (*Theaceae*): China, Yunnan, Gaoligong Mountains, Baoshan, Baihualin, alt. 1400 m, 8.VII.2009, T.G. Hou 21, HMAS 199579 (**holotype**), associated with *Pinnaspis* sp. (*Diaspididae*).

Basidiomata on branches, resupinate, perennial, 5–16 cm long, 4–11 cm wide, cinnamon brown, brown or chestnut brown; margin determinate; surface

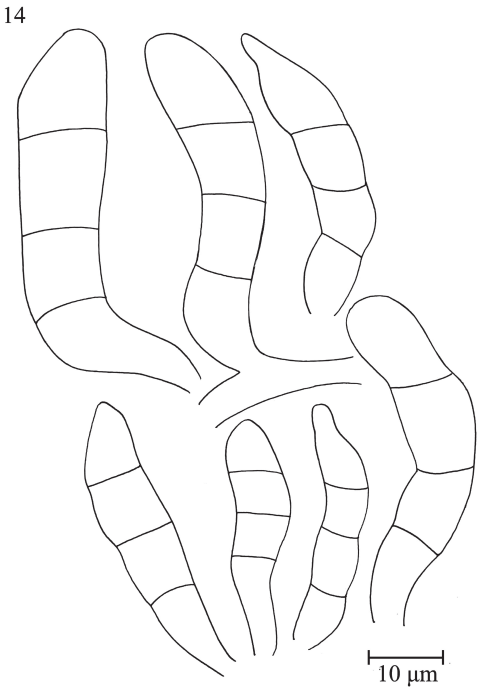

Fig. 14. Basidia of *Septobasidium euryae-groffii* (HMAS 199579, holotype).

smooth and protuberant, becoming cracked later. In section 1260–2620 μm thick, composed of 3–12 layers. Subiculum 40–50 μm thick, brown. Pillars 40–100 μm high, 50–165 μm wide, branched outwards to form a hyphal layer 360–560 μm high, the hyphae renewing to form two horizontal layers 130–180 μm high, forming a hymenial layer 50–60 μm thick at the upper, with closely packed parallel upright threads. Sometimes from the hymenium successively forming pillars 60–110 μm high, and 4 hyphal layers 810–1050 μm high. Hymenial layer renewing, up to 70–110 μm high. Basidia arising directly from the hyphae without a probasidial cell, cylindrical, straight or slightly curved, 4-celled, 20–45 × 5–8 μm, hyaline or brownish. Sterigmata coniform, 2–3 μm long. Basidiospores not seen. Haustoria consisting of irregularly coiled hyphae.

Remarks: *Septobasidium euryae-groffii* is similar to *S. henningsii* Pat., from which it differs in producing shorter pillars (40–110 μm vs 300–1100 μm) and shorter sterigmata (3–5 μm vs 14–34 μm). In addition, the basidioma surface of *S. euryae-groffii* is bumpy whereas that of *S. henningsii* is smooth. Another similar species, *S. thwaitesii* (Berk. & Broome) Pat., has curved basidia and probasidial cells.

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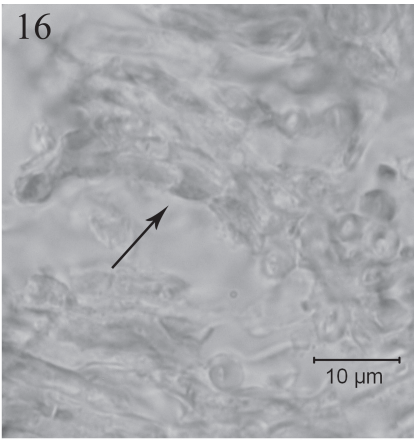
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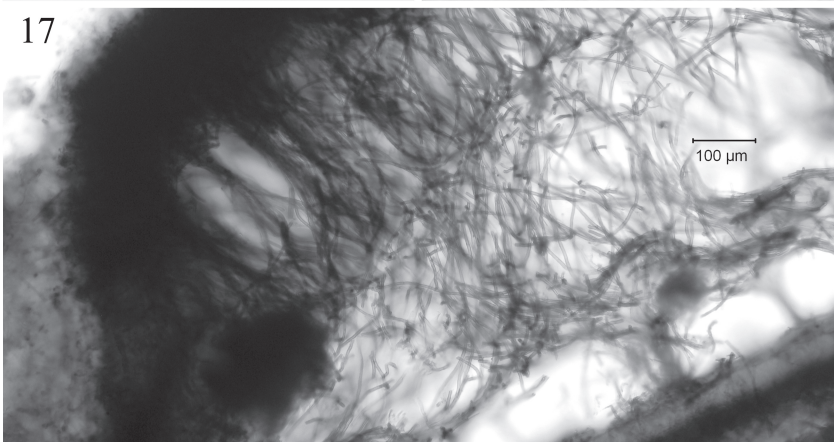
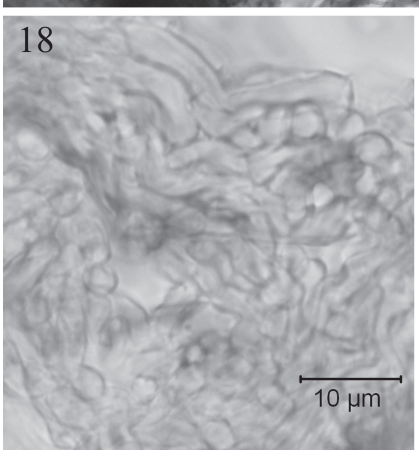
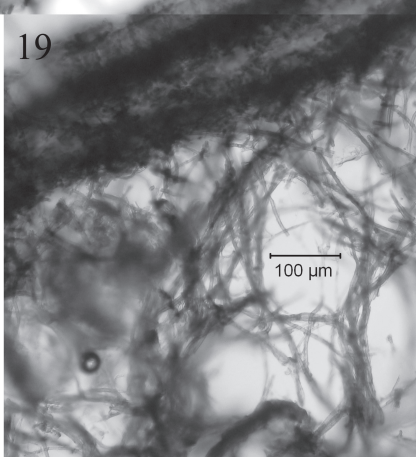

17
100 µm


18
10 µm


19
100 µm

Excluded species

Septobasidium parlatoriae Sawada, Rep. Dept. Agric. Govt. Res. Inst. Formosa. 51: 57, 1931.

A study of the type specimen of *S. parlatoriae*, borrowed from TAI, showed that no scale insects are present beneath the fungal hyphae. It is an anamorphic fungus.

To date, 23 species of *Septobasidium* have been reported in China (Sawada 1933, Couch 1938, Teng 1963, Tai 1979, Kirschner & Chen 2007, Lu & Guo 2009a, b,c, Lu et al. 2010), including the three species reported in this paper.

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Figs. 15–19. *Septobasidium euryae-groffii* (HMAS 199579, holotype). 15. Basidiomata on branches. 16. Basidia (arrow). 17, 19. Sections of basidiomata. 18. Haustoria.